UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,004	07/10/2001	Yukihiro Yoshimine	P107336-00025	7630

7590 02/23/2006

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
1050 Connecticut Avenue, N.W., Suite 600
Washington, DC 20036-5339

EXAMINER	
DIAMOND, ALAN D	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/901,004	YOSHIMINE ET AL.	
	Examiner	Art Unit	
	Alan Diamond	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The objection to claims 7 and 16 under 37 CFR 1.75(c) is expressly withdrawn in view of Applicant's argument presented on pages 7-9 of the Remarks filed November 23, 2005.

2. The rejection of claims 1-9 under 35 USC 112, second paragraph, has been overcome by Applicant's amendment of claim 1.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 10-14, 16, 17, and 20 are rejected under 35 U.S.C. 102(e) as being are anticipated by Kataoka et al (U.S. Patent 6,307,145), with evidence of physical properties provided by "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics*, Volume 2 (pp. 50-51) and "Common Shrinkage Values" from GE Polymerland.

Regarding claim 10, Kataoka et al discloses a solar cell module having a front surface protective layer **103**, a rear surface film **105**, and a photovoltaic element **101** sealed by sealing resin **102** and **104** (see col. 3, line 66 through col. 11, line 5; and

Figure 1A). Kataoka also teaches a glass fiber nonwoven fabric **106** that is formed with resin binder, preferably acrylic resin binder (see Figure 1A; and col. 7, line 31 through col. 8, line 16). The glass fiber nonwoven fabric **106** can be called a resin sheet or film due to the presence of this resin binder. The nonwoven fabric **106** is covered on all surfaces by and in direct contact with sealing resin **102** (see Figures 1A and 1B). The resin film **106** is smaller than the front and rear surface protective layers **103** and **105** and covers an area as large as the area of the photovoltaic element **101** (see Figure 1A). Thin film resin layer **108** and photovoltaic element **101** together read on the instant solar cell, and thus, in Kataoka et al's Figure 1A, there is only sealing resin disposed between an upper surface of the solar cell and a lower surface of the resin film **106**.

Regarding claims 11 and 13, the rear surface protecting layer **105** can be made using polyethylene terephthalate (col. 8, lines 40-42), a transparent resin that has a heat shrinkage rate of less than 1.0% (see "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics*, Volume 2 (pp. 50-51)). Although not a preferred embodiment, Kataoka et al teaches that a front surface protecting member made of glass is excellent in weathering resistance and is not permeable to moisture (see col. 1, lines 33-54). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).

Regarding claim 12, the binder for film **106** is made of materials including acrylic resin (col. 10, lines 61-65), which has heat shrinkage rates less than 1.0% (see

"Common Shrinkage Values" from GE Polymerland). (The heat shrinkage rate is an inherent property of materials.)

Regarding claims 14 and 16, the film **106** covers the solar cell and is formed inside from the edge of the overlaying area of the front surface protecting layer **103** and the rear surface protecting layer **105** (see Figure 1A).

Regarding claim 17, Kataoka et al teaches that glass, although not preferred, can be used as the front surface protecting member (see col. 1, lines 33-54). The module further comprises a rear surface protecting member **107** formed of a steel sheet, and a resin film **105** formed between the solar cell **101** and the rear surface protecting layer **107**, wherein the resin film **105** covers an area larger than the solar cell and smaller than the surface protecting layers (see Figure 1B; and col. 8, lines 48-54). Since the resin film **105** covers an area larger than the solar cell **101**, the resin film must cover at least a portion of the wiring which must be used to make use of the power generated by the solar cell.

With respect to claim 20, as seen in Figure 1A, only sealing resin **102** is disposed between a lower surface of the front surface protecting layer **103** and the upper surface of the resin film **106**.

Since Kataoka et al teaches the limitation recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5, 7, 8, 10-14, 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (U.S. Patent 6,307,145) with evidence of physical properties provided by "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics*, Volume 2 (pp. 50-51) and "Common Shrinkage Values" from GE Polymerland.

Regarding claim 1, Kataoka et al discloses a solar cell module having a front surface protective layer **103**, a rear surface film **105**, and a photovoltaic element **101** sealed by sealing resin **102** and **104** (see col. 3, line 66 through col. 11, line 5; and Figure 1A). Kataoka also teaches a glass fiber nonwoven fabric **106** that is formed with resin binder, preferably acrylic resin binder (see Figure 1A; and col. 7, line 31 through col. 8, line 16). The glass fiber nonwoven fabric **106** can be called a resin sheet or film due to the presence of this resin binder. The nonwoven fabric **106** is covered on all surfaces by and in direct contact with sealing resin **102** (see Figures 1A and 1B). The resin film **106** is smaller than the front and rear surface protective layers **103** and **105** and covers an area as large as the area of the photovoltaic element **101** (see Figure 1A). Thin film resin layer **108** and photovoltaic element **101** together read on the instant solar cell, and thus, in Kataoka et al's Figure 1A, there is only sealing resin disposed between an upper surface of the solar cell and a lower surface of the resin film **106**. It is the Examiner's position that the nonwoven fabric **106** is "moisture-proof" and will at least

provide some degree of moisture-proofness in view of the materials that it is made of, i.e., glass fibers in an acrylic resin binder (see col. 7, line 32 through col. 8, line 16).

Kataoka et al also teaches, "Another arrangement may be such that photovoltaic elements are integrated on an insulated substrate to achieve desired voltage or current" (see col. 10, lines 50-54), i.e., a plurality of solar cell elements may be used on a single substrate, wherein a module made using the disclosed solar cell elements would have a resin film **106** covering the area including an array of the solar cell elements.

Regarding claims 2, 4, 11 and 13, the rear surface protecting layer **105** can be made using polyethylene terephthalate (col. 8, lines 40-42), a transparent resin that has a heat shrinkage rate of less than 1.0% (see "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics*, Volume 2 (pp. 50-51)). Although not a preferred embodiment, Kataoka et al teaches that a front surface protecting member made of glass is excellent in weathering resistance and is not permeable to moisture (see col. 1, lines 33-54). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).

Regarding claims 3 and 12, the resin film **106** is made of materials including acrylic resin (col. 10, lines 61-65), which has heat shrinkage rates less than 1.0% (see "Common Shrinkage Values" from GE Polymerland). (The heat shrinkage rate is an inherent property of materials.)

Regarding claims 5, 7, 14 and 16, the resin film **106**, covers the solar cell and is formed inside from the edge of the overlaying area of the front surface protecting layer **103** and the rear surface protecting layer **105** (see Figure 1A).

Regarding claims 8 and 17, Kataoka et al teaches that glass, although not preferred, can be used as the front surface protecting member (see col. 1, lines 33-54). The module further comprises a rear surface protecting member **107** formed of a steel sheet, and a resin film **105** formed between the solar cell **101** and the rear surface protecting layer **107**, wherein the resin film **105** covers an area larger than the solar cell and smaller than the surface protecting layers (see Figure 1B; and col. 8, lines 48-54). Since the resin film **105** covers an area larger than the solar cell **101**, the resin film must cover at least a portion of the wiring which must be used to make use of the power generated by the solar cell.

With respect to claims 19 and 20, as seen in Figure 1A, only sealing resin **102** is disposed between a lower surface of the front surface protecting layer **103** and the upper surface of the resin film **106**.

The solar cell module of Kataoka et al differs from the instantly claimed solar cell module claims because Kataoka et al does not explicitly disclose a single resin film covering an area as large or larger than the area of the array of the solar cells, as recited in claim 1. As explained above, Kataoka et al discloses the use of a resin film nonwoven fabric **106** covering a single solar cell and having an area smaller than that of the protecting layers, as well as the use of a plurality of solar cells. Kataoka et al does not disclose the structure of the nonwoven fabric **106** when a plurality of solar cells is

used. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a single nonwoven fabric **106** to cover Kataoka et al's plurality of solar cells because using a single nonwoven fabric **106** would simplify the method of manufacturing the solar cell module by not requiring the formation of an individual resin film for each of the solar cell elements.

7. Claims 6, 9, 15, and 18 are rejected under 35 U.S.C. 1O3(a) as being unpatentable over Kataoka et al with evidence of physical properties provided by "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics*, Volume 2 (pp. 50-51) and "Common Shrinkage Values" from GE Polymerland, as applied above to claims 1-5, 7, 8, 10-14, 16, 17, 19 and 20, and further in view of Komori et al (EP 829909 A2).

Kataoka et al with said evidence is relied upon for the reasons recited above. The solar cell module described by Kataoka et al with said evidence differs from the instant invention because they do not disclose that Kataoka et al's nonwoven fabric resin film **106** is at least 3 mm from the edge of the front and rear protective members, as recited in claims 6 and 15, and that protruding wiring is covered with an insulating tape, as recited in claims 9 and 18.

Regarding claims 6 and 15, Komori et al discloses a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the inorganic fibrous sheet **402** comprising the acrylic resin binder was larger than the cell block **401** by 5 mm on each side, the insulating resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer

408 was larger than the solar cell block by 80 mm on each side (see page 9, lines 52-54; and page 10, lines 2-13). Therefore, the inorganic fibrous sheet **402** was about 75 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**, and the insulating resin film **407** was about 65 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**. Making the inorganic sheet **402** (**102**) smaller than the other layers "prevents the formation of a moisture migration path" (see page 4, lines 3-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nonwoven fabric **106** described by Kataoka et al to fabricate the module such that the nonwoven fabric **106** is set at a distance from the edge of the protective layers as taught by Komori et al because this improves the adhesion within the module and prevents the formation of moisture migration paths.

Regarding claims 9 and 18, Komori et al teaches the use of insulative tape **208** on a positive side terminal **206a** (see page 9, lines 11-13). Insulating electrical tape is commonly used to cover exposed wiring in electrical applications to prevent short-circuiting and also to protect against electrical shock. For example, electrical tape is extensively used by electricians and others making electrical connections because it offers a simple and efficient means of insulating exposed conductors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module described by Kataoka et al to cover the wiring with insulating tape as taught by Komori et al because insulating tape provides a simple and efficient means for insulating conducting members.

Response to Arguments

8. Applicant's arguments filed November 23, 2005 have been fully considered but they are not persuasive.

With respect to both independent claims 1 and 10, Applicant argues that Kataoka et al does not disclose or suggest a resin film wherein all surfaces of the resin film are surrounded by and in contact with the sealing resin and wherein only the sealing resin is disposed between an upper surface and a lower surface of resin film. Applicant argues that all of the surfaces of the resin film 108 are not surrounded by and in contact with the sealing resin 102, 104, because a lower surface of the resin film 108 is in contact with an upper surface of the solar cell 101. Applicant also argues that sealing resin 102, 104 is not all that is disposed between film 106 and the solar cell 101. Applicant argues that resin film 108 is disposed between film 106 and solar cell 101. However, this argument is not deemed to be persuasive because, as noted above, it is the Examiner's position that it is film 106 that reads on the instant resin film. Thin film resin layer 108 and photovoltaic element 101 together read on the instant solar cell, and thus, in Kataoka et al's Figure 1A, there is only sealing resin disposed between an upper surface of the solar cell and a lower surface of the resin film 106.

Applicant argues that it would not have been obvious for a person of ordinary skill in the art to combine one of the resin films 37 and 38 (of Tourneux) with the solar cell of Kataoka et al as a replacement for either the resin film 108 or glass fiber layer 106 for covering a plurality of solar cells. In particular, with respect to claim 1 and its dependent claims, Applicant argues that Tourneux's resin films 37 and 38 extend across the entire

length of the laminated solar cell assembly, and that Tourneux teaches that this provides additional flexibility opposing stresses that are dangerous to the solar cell assembly. However, as set forth in the rejection above, Tourneux as a secondary reference is not needed to reject instant claim 1 and its dependent claims. It is the Examiner's position that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a single nonwoven fabric 106 to cover Kataoka et al's plurality of solar cells because using a single nonwoven fabric 106 would simplify the method of manufacturing the solar cell module by not requiring the formation of an individual resin film for each of the solar cell elements.

Applicant argues that Komori et al does not teach or suggest a resin film, wherein all surfaces of the resin film are surrounded by and in contact with a sealing resin. Applicant argues that a lower surface of Komori et al's fibrous sheet 402 directly contacts an upper surface of the cell block 401. However, this argument is not deemed to be persuasive because, as noted above, it is Kataoka et al that teaches the instant resin film, wherein all surfaces of the resin film are surrounded by and in contact with a sealing resin. The Examiner maintains that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nonwoven fabric 106 described by Kataoka et al to fabricate the module such that the nonwoven fabric 106 is set at a distance from the edge of the protective layers as taught by Komori et al because this improves the adhesion within the module and prevents the formation of moisture migration paths. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the

solar cell module described by Kataoka et al to cover the wiring with insulating tape as taught by Komori et al because insulating tape provides a simple and efficient means for insulating conducting members.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
February 21, 2006